



United States
Department of
Agriculture

Forest
Service

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Reply To: 3420

Date: SEP 4 1987

Subject: Insect Damage to Ponderosa Pine and Douglas-fir on the Naches RD

To: Forest Supervisor, Wenatchee NF

Forest Pest Management entomologist, Don Scott, met with Mark Loewen, silviculturist from the Naches Ranger District, on June 18, to evaluate insect-caused damage to ponderosa pine on the Wazoo 22 unit and aphid damage to Douglas-fir in the Westfall 1 Seed Orchard.

The Wazoo 22 unit (T. 13 N., R. 13 E., sec. 7) was harvested in 1985 by seed tree method. The Douglas-fir and grand fir were removed and the overstory western larch and ponderosa pine were left to naturally regenerate the stand with species less susceptible or resistant, respectively, to laminated root rot caused by Phellinus weirii. Widely distributed ponderosa pine and western larch represented the advanced regeneration in the understory.

The young pine trees were being defoliated by a Neodiprion spp. sawfly. Light feeding damage was observed to the older needles, where a few small colonies containing 5 to 7 larvae were found gregariously feeding. Feeding by Neodiprion sawflies causes a general weakening of trees and retarded growth rather than tree mortality. Normally these sawflies occur in small numbers year after year and, consequently, escape attention.

Occasionally some species increase to outbreak proportions and cause considerable defoliation for a year or two. Outbreaks are typically of short duration and subside abruptly due to natural causes. Our observations suggest that the population of sawfly and resultant feeding damage is light. We do not expect the population to increase beyond current levels, and will likely decrease to undetectable levels within a year or two.

In addition to the sawfly damage, a minor amount of defoliation to current-year needles resulted from feeding by the pine needle sheath miner (Zelleria haimbachi). Damage is evident by the presence of small amounts of fine silken webbing around the needle bases and buds, and the small holes located near the needle bases through which the larva feeds. Larvae are very small and usually inconspicuous during early instars while feeding within needles. Later on, they feed somewhat exposed, and can be found within the construction of webbing at the needle bases. Like the sawfly, the pine needle sheath miner weakens but does not kill trees, and may contribute (in combination with the sawfly) to the slightly compressed-appearing new shoots evident on certain trees. A number of parasitic wasps apparently regulate needle sheath miner populations naturally, and only minor damage should be expected; populations will subside on their own. We suggest monitoring the infestation. If the defoliation worsens in the next couple of seasons, we will schedule another visit by an entomologist to





assess the outbreak and discuss management alternatives. We do not believe any mitigating measures are necessary at this time.

The second area visited was the Westfall 1 Seed Orchard and evaluation plantation site (T. 14 N., R. 13 E., sec. 35). The seed orchard was established in 1981. No site prep (ripping) was done prior to planting. About 2 years after planting, the orchard was cross-ripped between tree groups (clusters of 9 trees from unrelated families). Douglas-fir trees within the seed orchard and evaluation plantation were infested with Cooley spruce gall adelgid. Populations ranged from moderate to heavy. Damage to trees was evident from a distance: trees showed a general chlorosis of the foliage and more heavily-infested trees indicated some stunting. Up close, the white cottony-tufted adelgid colonies were readily visible and the needles appeared compressed, frequently twisted and wilted, and mottled with yellowish spots where the adelgids had been feeding.

Douglas-fir is an alternate host for this insect; the primary host being spruce. Severe infestations on poor sites cause shedding of foliage which can be very damaging to a susceptible host. Some families of Douglas-fir display various amounts of resistance. Although heavy infestations may occasionally kill Douglas-fir and spruce seedlings, damage is primarily in the form of crown disfigurement and reduction of growth.

The District's concerns over the adelgid problem were twofold: (1) what, if anything, should be done about this insect infestation; and (2) since the seed orchard and adjoining evaluation plantation trees exhibit differential susceptibility to the adelgid, is there any merit in attempting to evaluate adelgid resistance, in addition to growth and performance of families.

Our advice, in response to the first concern, is to monitor the adelgid situation for the occurrence of insect-caused mortality and contact FPM for a reassessment if mortality starts to occur. Since the seed orchard is scheduled for roguing within 5 years, the benefits of treating to control the insect--it has been present nearly since the seed orchard was planted in 1981--are dubious, considering the short time until roguing, the probable need for annual treatment, and the cost of the treatment.

To help address the second concern, we consulted with the Regional geneticist. He suggested that since the condition of the trees (chlorosis and suppressed growth) probably related to a number of factors beside the insect, including inadequate site preparation prior to planting to improve soil condition (compaction), microclimate at site resulting in periodic frost damage, variability of tree families to adelgid susceptibility, and the fact that the complete randomization of families in the seed orchard makes correlations of measurements among families extremely difficult, it would probably be of little value to try to measure adelgid resistance. We, therefore, advise against attempting to monitor and/or measure adelgid resistance. Tracking this component through related families within the completely randomized planting of the seed orchard, alone, would probably prove to be frustrating, if not impossible. We do suggest, however, that when roguing is done--and other factors of growth and performance being equal--the trees which express aphid





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resistance be favored as leave trees over those which are apparently more susceptible. This action will incorporate the resistance factor into the best performing stock without taking the measurements for it.

If you have any questions about this evaluation or would like assistance with other entomological or pathological problems, please contact Forest Pest Management at (503) 221-2727 (commercial) or 423-2727 (FTS).

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cc:
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